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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,097	10/13/2005	Paul King	NREL 03-11	4772
7590	11/03/2006		EXAMINER	
Paul J White			CHOWDHURY, IQBAL HOSSAIN	
Nrel			ART UNIT	PAPER NUMBER
1617 Cole Boulevard				
Golden, CO 80401			1652	

DATE MAILED: 11/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/553,097	KING, PAUL	
	<b>Examiner</b>	<b>Art Unit</b>	
	Iqbal Chowdhury, Ph.D.	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_\_.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-18 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_ is/are allowed.  
 6) Claim(s) \_\_\_\_ is/are rejected.  
 7) Claim(s) \_\_\_\_ is/are objected to.  
 8) Claim(s) 1-18 are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Election/Restrictions***

Claims 1-18 are pending.

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions, which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group, I claim(s) 1-3, drawn to an oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 78 of HydA1 iron hydrogenase.

Group, II claim(s) 1-3, drawn to an oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 240 of HydA1 iron hydrogenase.

Group, III claim(s) 1-3, drawn to an oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 244 of HydA1 iron hydrogenase.

Group, IV claim(s) 1-3, drawn to an oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 86 of HydA1 iron hydrogenase.

Group, V claim(s) 1-3, drawn to an oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 248 of HydA1 iron hydrogenase.

Group, VI claim(s) 1-3, drawn to an oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 247 of HydA1 iron hydrogenase.

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Group, VII claim(s) 1-3, drawn to an oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 82 of HydA1 iron hydrogenase.

Group, VIII claim(s) 1-3, drawn to an oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 89 of HydA1 iron hydrogenase.

Group, IX claim(s) 1-3, drawn to an oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 355 of HydA1 iron hydrogenase.

Group, X claim(s) 1-3, drawn to an oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 93 of HydA1 iron hydrogenase.

Group, XI claim(s) 1-3, drawn to an oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 252 of HydA1 iron hydrogenase.

Group, XII claim(s) 4-7, drawn to a polynucleotide encoding oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 78 of HydA1 iron hydrogenase.

Group, XIII claim(s) 4-7, drawn to a polynucleotide encoding oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 240 of HydA1 iron hydrogenase.

Group, XIV claim(s) 4-7, drawn to a polynucleotide encoding oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 244 of HydA1 iron hydrogenase.

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Group, XV claim(s) 4-7, drawn to a polynucleotide encoding oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 86 of HydA1 iron hydrogenase.

Group, XVI claim(s) 4-7, drawn to a polynucleotide encoding oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 248 of HydA1 iron hydrogenase.

Group, XVII claim(s) 4-7, drawn to a polynucleotide encoding oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 247 of HydA1 iron hydrogenase.

Group, XVIII claim(s) 4-7, drawn to a polynucleotide encoding oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 82 of HydA1 iron hydrogenase.

Group, XIX claim(s) 4-7, drawn to a polynucleotide encoding oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 89 of HydA1 iron hydrogenase.

Group, XX claim(s) 4-7, drawn to a polynucleotide encoding oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 355 of HydA1 iron hydrogenase.

Group, XXI claim(s) 4-7, drawn to a polynucleotide encoding oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 93 of HydA1 iron hydrogenase.

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Group, XXII claim(s) 4-7, drawn to a polynucleotide encoding oxygen-resistant iron hydrogenase polypeptide derived from oxygen-sensitive iron hydrogenase by substitution at position 252 of HydA1 iron hydrogenase.

Group, XXIII claim(s) 8-9 and 13, drawn to a method of producing hydrogen in green algae.

Group, XXIV claim(s) 10-12, drawn to a method of making nucleic acid encoding an oxygen-resistant iron hydrogenase.

Group, XXV claim(s) 14-18, drawn to a method of making an oxygen-resistant iron-hydrogenase.

2. The inventions listed as Groups I - XXV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The polynucleotide encoding a polypeptide mutant iron-hydrogenase of Group XII-XXII, polypeptide mutant iron-hydrogenase of Group I-XI and polypeptide of HydA1 and CPI, are each unrelated and chemically distinct entities. The only shared technical feature of these groups is that they all relate to polynucleotide encoding a polypeptide iron-hydrogenase.

However, this shared technical feature is not a “special technical feature” as defined by PCT Rule 13.2 as it does not define a contribution over the art. A DNA encoding an iron-hydrogenase is known in the art (Forestier et al. GenBank Accession Number AY055755, “Chlamydomonas reinhardtii iron-hydrogenase HydA mRNA”, created 12/31/2001). Thus, a DNA encoding an iron-hydrogenase protein does not make contribution over the prior art.

37 CFR 1.475 does not provide for multiple products and/or methods within a single application. Therefore, inventions of Group I - XXV lack unity of invention.

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and a product claim is subsequently found allowable, withdrawn process claims that depend from or otherwise include all the limitations of the allowable product claim will be rejoined in accordance with the provisions of MPEP § 821.04. **Process claims that depend from or otherwise include all the limitations of the patentable product** will be entered as a matter of right if the amendment is presented prior to final rejection or allowance, whichever is earlier. Amendments submitted after final rejection are governed by 37 CFR 1.116; amendments submitted after allowance are governed by 37 CFR 1.312.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103, and 112. Until an elected product claim is found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowed product claim will not be rejoined. See “Guidance on Treatment of Product and Process Claims in light of *In re Ochiai*, *In re Brouwer* and 35 U.S.C. § 103(b),” 1184 O.G. 86 (March 26, 1996). Additionally, in order to retain the right to rejoinder in accordance with the above policy, Applicant is advised that the

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process claims should be amended during prosecution either to maintain dependency on the product claims or to otherwise include the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Iqbal Chowdhury whose telephone number is 571-272-8137. The examiner can normally be reached on 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapu Achutamurthy can be reached on 703-272-0928. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Respectfully,

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